

REMARKS

The Office Action mailed on February 10, 2009, has been reviewed and the comments of the Patent and Trademark Office have been considered. Prior to this paper, claims 1-21 were pending, with claims 6 and 15-18 being withdrawn from prosecution. By this paper, Applicants cancel claims 2, 4-7 and 12-13, and add claims 22-33. Therefore, claims 1, 3, 8-11 and 14-33 are now pending.

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Acknowledgement of Priority and Receipt of Pertinent Documents

Applicants request that an examiner acknowledge Applicants' claim to priority, and acknowledge receipt of the certified copies of the priority documents.

Drawing Objections

In the Office Action, the drawings are objected to. In response, in order to advance prosecution, and without prejudice or disclaimer, claims 8 and 11 are cancelled, and the specification has been amended. Reconsideration is requested.

Claim Objections

In the Office Action, claims 8 and 11 are objected to based on the allegation that the gluing or pressing described in claim 8 is not shown in the drawings. In response, in order to advance prosecution, and without prejudice or disclaimer, claims 8 and 11 are cancelled. Reconsideration is requested.

Rejections Under 35 U.S.C. §112, First Paragraph

In the Office Action, claims 20 and 21 are rejected under 35 U.S.C. §112, First Paragraph, as allegedly failing to comply with the written description requirement. Applicants traverse this rejection.

The tank 10 according to the present invention comprises two separate tanks, i.e. the inner tank 11 and the outer tank 16, said two tanks being concentrically arranged in spaced relation, the space between said two tanks 11, 16, being filled with an insulating material 20, as shown in Figures 1 and 2. Further, the wall 14 of the inner tank 11 comprises an inner structurally supporting wall element 24 and an outer structurally supporting wall element 25 together with an intermediate fluid tight barrier 26 of metal or plastic materials.

As a preliminary matter, claims 20 and 21 refer to the wall 14 of the *inner tank 11*. They do not refer to the *outer tank 16*. Page 11 of the WIPO publication of the present application, WO2004/001280, specifies that the reference number “24” relates to the inner structurally supporting wall element of the inner tank wall, and that the reference number “25” relates to the outer structural supporting wall element of the inner tank wall. Further, the reference number “28” refers to the lower, inner, vertical ring shaped steel plate, while the reference number “29” refers to the lower, outer, vertical ring shaped steel plate, both said two vertical rings being depicted in the Figure 3 as additional, integrated parts of the inner wall 14.

Page 8, lines 19-27 of WO2004/001280 state that the “*lower part of the wall is erected on a foundation, the lower part of which comprises a base plate 27 of steel, an inner and outer steel plate 28, 29 extending along the inner and outer circumference of the wall and fixed by means of welding with the horizontal base plate 27.*” The wall referred to here is the wall 14 of the inner tank 11, referring to Figure 1 and Figure 3. Hence, it is respectfully submitted that the outer steel ring 29 is a part of the inner wall 14, and not a part of the outer wall. The original application thus supports claims 20 and 21.

Rejections Under 35 U.S.C. §112, Second Paragraph

In the Office Action, claims 5, 7 and 14 are rejected under 35 U.S.C. §112, Second Paragraph, as being indefinite. In response, Applicants cancel claims 5 and 7, and amend claim 1 to recite “the fluid tight barrier being formed of thin joined plates and/or joined sheets of metal or plastic materials,” and thus submit that claim 14 is not indefinite.

Rejections Under 35 U.S.C. § 103

In the Office Action, claims 1, 5, 7, 12 and 14 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Bomhard (U.S. Patent No. 4,366,654) in view of Jean (U.S. Patent No. 5,586,513). Claim 2 is rejected in view of Bomhard and Closner (U.S. Patent No. 3,926,134). Claim 3 is rejected in view of Bomhard when combined with Jean and Closner. Claim 4 is rejected in view of the combination of Bomhard with Jean and Hendriks (U.S. Patent No. 4,069,642). Claims 12 and 13 are rejected in view of the combination of Bomhard with Jean and Papanicolaou (US. Patent No. 3,948,406). Claim 19 is rejected in view of Bomhard when combined with Betille (U.S. Patent No. 4,747,513).

Additionally, the Office Action rejects claims 1, 5 and 7 under 35 U.S.C. §103(a) as being unpatentable over GB (GB 1341892) in view of Jean. Claim 2 is rejected in view of GB and Closner. Claim 3 is rejected in view of GB when combined with Jean and Closner. Claims 8-11 are rejected in view of GB when combined with Jean and Nelson (U.S. Patent No. 3,538,661) and Lang (U.S. Patent No. 3,559,835). Claim 19 is rejected in view of the combination of GB with Betille. Claims 20 and 21 are rejected in view of GB when combined with Betille and Nelson and Lange.

In response, in order to advance prosecution, and without prejudice or disclaimer, Applicants have cancelled claims 2, 4, 5, 6, 7, 12 and 13, rendering the rejection of those claims moot.

Also in response, in order to advance prosecution, and without prejudice or disclaimer, Applicants have amended claim 1, as seen above, and respectfully request reconsideration in view of the reasons that follow.

Rejections based on Bomhard:

The Office Action asserts that “Bomhard discloses the invention except for the metal plate metal being joined metal plates.” Applicants disagree. One significant difference between the Bomhard inner tank and the inner tank of claim 1 is that Bomhard’s build-up of the wall structure of inner tank lacks the sandwich build-up as defined in the present claim 1.

When comparing the doubled-walled tank 1 according to Bomhard and the free-standing tank 10 (with reference to the specification as an exemplary embodiment) according to claim 1, the wall 4 of the outer tank 2 according to Bomhard corresponds to the wall 18 of outer tank wall 16 according to Applicants' disclosure, the insulation material 13 of Bomhard corresponds to the insulation material 20 of Applicants' disclosure, and the inner tank 3 of Bomhard corresponds to the inner tank 11 of Applicants' disclosure. ***When comparing Bomhard to claim 1, comparison must be made to the construction and build-up of the inner tank 3 of Bomhard and the inner tank 11 of Applicants' disclosure, embodied in claim 1.***

There is no indication in Bomhard of the presence of a sandwich-type inner tank, or any tank for that matter, comprising the combination of three integrated wall elements (*i.e.* i. an inner structurally supporting wall element of concrete, ii. an outer structurally supporting wall element of concrete, and iii. an intermediate fluid tight barrier), where the three combined elements form a compact, integrated structural load bearing and fluid tight wall together resisting against expansion and contraction forces resulting from storing the cryogenic fluid in the inner tank.

In contrast, Bomhard relates to an inner tank comprising basically a steel plate membrane intended to be in direct contact with the cryogen liquid and a concrete wall surrounding said membrane. Bomhard does not teach an inner structurally supporting concrete wall element protecting the steel membrane from direct contact with the cryogenic liquid and restricting radial movement of the thin walled barrier. Hence, when a cryogenic liquid is filled into the inner tank the steel membrane will tend to contract more than the surrounding concrete wall. Thus the steel membrane will tend to move inwards away from its support from the surrounding concrete wall. In order to prevent such separation, Bomhard depends on anchors or bolts, embedded in the surrounding concrete wall - see the corner shown in Figure 2 of Bomhard.¹ Therefore, unless heavily reinforced and/or pre-stressed, the

¹ It should be appreciated that the use of such bolts requires extensive reinforcement in the region around said bolts, since concrete according to the well and wide known common knowledge cannot withstand tension of any significant size unless being reinforced and most often pre-stressed, while concrete can withstand substantial compressive loads without failing.

concrete around said bolts will eventually fail when the inner steel membrane 9 contracts due to the filling of the cryogen liquid into the inner tank 3.

According to the invention of claim 1, referring to the exemplary embodiment detailed in the specification, the inner structurally supporting element 24 of the wall 14 of the inner tank 11 will, as is detailed on page 4, lines 3-7 of the present application, function as a restraint for the fluid tight wall element, while at the same time the fluid tight wall element 26 exerts a pre-stressing force onto the inner load supporting wall element.

Note further that Bomhard teaches that the insulating material 13 of Bomhard is perlite. (Bomhard, col. 3, lines 9-11.) While perlite has good insulation properties, it does not withstanding structural loading, in contrast to the alleged corresponding features of Applicants' invention.

Further, Bomhard fails to teach or suggest the feature of the outer surface of said inner structurally supporting wall element of concrete being in contact with the steel membrane, preventing the steel membrane from contraction in radial direction inwards when cryogenic fluid is filled into the tank. ***In fact, the use of the T-shaped elements fixed to the steel plates at the lower corner, embedded into the concrete, points the person skilled in the art away from adding an internal wall inside of the steel plate of Bomhard.***

MPEP § 2144.05(III), entitled Rebuttal Of *Prima Facie* Case Of Obviousness, states that a “*prima facie* case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention.” (MPEP § 2144.05(III), second paragraph, emphasis added, citations omitted.) MPEP §2145(X)(2) further states that it “is improper to combine references where the references teach away from their combination.” In view of the above (Bomhard teaching the use of T-shaped elements fixed to the steel plates), Applicants respectfully submit that to the extent that a case of obviousness has been established, that case is hereby rebutted.

Jean fails to remedy the just-detailed deficiencies of Bomhard. In summary, Bomhard does not render claim 1 obvious for at least these reasons, but there is more.

Applicants respectfully submit that the ordinary artisan would not have sought to modify Bomhard in accordance with Jean as proffered in the Office Action. Jean teaches a water tight thermally insulating tank built into a bearing structure and including a primary watertight barrier and a secondary watertight barrier. As set out in cols. 1 and 6 of Jean, the thermally insulated tank according to Jean is designed and intended for use as storage tanks *in the hull of a ship* for transport by sea of liquefied natural gas, where the tank must be able to withstand the impact on the tank walls by the movements of the liquid during transport.

There is no teaching or suggestion in Jean of the use of concrete as a construction material, and there is no teaching or suggestion of an inner tank wall consisting of an inner structurally supporting wall element made of concrete and an outer structurally supporting wall element of concrete and an intermediate thin walled barrier of steel. Indeed, the use of concrete would not be consistent with marine architecture. In this regard, the ordinary artisan working in the concrete tank arts would not have looked towards Jean, which deals with ships, concrete not being a traditional marine architecture material. Moreover, the ordinary artisan, starting with Bomhard, would not modify Bomhard to utilize Jean because Bomhard relates to large stationary storage tanks for use on land, while Jean relates to storage tanks in steel ships for transport on sea. Regardless, as noted above, Jean does not remedy the deficiencies of Bomhard. If the ordinary artisan were to modify Bomhard by applying the teaching of Jean, the person skilled in the art would still not arrive at a solution having an inner tank with a wall comprising an outer and inner structurally supporting wall element of concrete and an intermediate steel membrane.

Claim 1 is not obvious in view of the Bomhard-Jean combination.

Rejections Based on GB:

The alleged inner wall of GB does not have a wall structure comprising an inner structurally supporting wall element, an outer, structurally supporting wall element and an intermediate fluid tight barrier. Further, the insulation material 39 (which is disclosed as perlite, vermiculite, polyurethane foam or glass wool, etc.) of GB cannot be regarded as a

structurally supporting wall element because the disclosed materials have no structural strength.

Jean does not remedy the deficiencies of GB. Jean does not teach or suggest the use of concrete as a construction material, nor of an inner tank wall comprising an inner structurally supporting wall element made of concrete and an outer structurally supporting wall element of concrete and an intermediate fluid tight barrier as recited in claim 1.

Further, the ordinary artisan seeking to modify GB would not look towards Jean, because GB is directed to large stationary storage tanks on land, while Jean, as noted above, relates to storage tanks in steel ships for transport on sea. Thus, the claims are not obvious in view of the GB-Jean combination for this additional reason.

Rejection of claim 9:

Claim 9 is rejected in view of the combination of GB, Jean, Nelson and Lange. The liner 32 of GB does not extend beneath an outer structurally supporting concrete wall surrounding the vertical steel liner 36, since there is no such outer structurally supporting wall element disclosed in the British specification. Further, there is no indication what so ever in GB of an additional outer and inner, vertical steel plates 28, 29 extending along the inner and outer periphery of the vertical wall 14 of the inner fluid tight tank 11, in addition to the intermediate fluid tight barrier.

Lange does not teach or suggest an additional outer and inner, vertical steel plates extending along the inner and outer periphery of the vertical wall 14 of the inner fluid tight tank 11, in addition to the intermediate fluid tight barrier. Nelson does not disclose these features either, and also does not use concrete. Jean fails to remedy the just-mentioned deficiencies. Thus, claim 9 would not have been obvious for these additional reasons.

Claim 19:

Betille teaches a device forming a heat insulating wall structure for a fluid tight tank, intended to be integrated into the hull of a tanker ship for transporting liquid natural gas.

Betille does not teach a combined wall structure of concrete, an inner structurally supporting concrete wall element, an outer structurally supporting concrete wall element and an intermediate membrane as recited. Accordingly it would not have been obvious for the ordinary artisan to have utilized Betille in combination with either of Bomhard or Jean.

Rejoinder of Claims 6 and 15-18

Claims 6 and 15-18 stand withdrawn. Applicants note that claim 6 depends from claim 1, a claim that is allowable. Applicants respectfully request that these claims be rejoined and allowed due to their dependency from claim 1, a claim that is allowable. Applicants respectfully submit that no significant burden is placed on the PTO by rejoining and examining these claims. Indeed, such action is concomitant with the indication that “upon allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim.”

Claims 15-18 are also withdrawn. These claims are *method claims drawn to a method of making the apparatus of claim 1*. Pursuant to MPEP § 821.04 and *In re Ochiai*, 71 F.3d 1565, 37 USPQ2d 1127 (Fed. Cir. 1995), it is respectfully requested that these claim be rejoined and considered, since MPEP § 821.04 states that “when a product claim is found allowable, applicant may present claims directed to the process of making and/or using the patentable product.”

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect

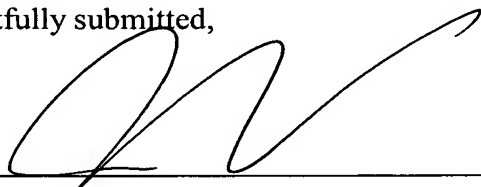
information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Examiner Castellano is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

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FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 295-4747
Facsimile: (202) 672-5399

Respectfully submitted,

By 

Martin J. Cosenza
Attorney for Applicants
Registration No. 48,892